

MICRONEEDLE DEVICES AND METHODS OF  
MANUFACTURE

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ABSTRACT OF THE DISCLOSURE

10 Microneedle devices and methods of manufacturing the microneedle  
devices. The microneedle devices include microneedles protruding from a  
substrate, with the microneedles piercing a cover placed over the substrate  
surface from which the microneedles protrude. The cover and the microneedle  
substrate together define a capillary volume in fluid communication with the  
base of each microneedle. One manner of using microneedle arrays of the  
present invention is in methods involving the penetration of skin to deliver  
medicaments or other substances and/or extract blood or tissue. Manufacturing  
15 methods may include simultaneous application of pressure and ultrasonic energy  
when piercing the cover with the microneedles.

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